FRD ACTIVITIES REPORT
October - December 2014

RESEARCH PROGRAMS

Project Sagebrush

The comprehensive data report for Phase 1 of Project Sagebrush (PSB1) is presently in the process of internal revision and editing. It will provide a detailed description covering all aspects of experimental design, instrumentation, measurements, quality control procedures, and the final database for the project.

A manuscript for journal publication tentatively titled 'Revisiting the value of the horizontal plume spread parameter σ_y: Part I' has been drafted that covers some of the key findings of PSB1. It is presently in internal FRD review. A companion paper (Part II) that addresses some of the questions regarding the magnitudes of σ_y and σ_θ raised in the first paper has also been drafted and is in internal FRD review. This complementary analysis is focused on possible site differences that could be contributing to the differences in σ_y and σ_θ observed during PSB1 compared to those utilized in many existing modeling schemes.

The Washington State University (WSU) instrumentation was removed from the Grid 3 tower on November 10. The combination of Grid 3 tall tower measurements provided by WSU and FRD over the period of September, 2013 to November, 2014 will provide a very detailed look at the vertical profiles of turbulence over a broad range of conditions. Bruce Hicks visited the INL test site in November and has begun analysis of Grid 3 tower data provided by FRD and WSU. He is presently utilizing these data sets to assist him with investigations of the stable boundary layer. Receipt of the complete WSU data set is pending. (Dennis.Finn@noaa.gov, Rick Eckman and staff)

FRD is planning to conduct Phase 2 of Project Sagebrush in the summer and fall of calendar year 2015. The focus of this phase will be dispersion in light wind conditions. A 1974 study conducted by FRD is still widely cited as virtually the only tracer data set representing the light wind case. Because of the unpredictable wind direction, the tracer samplers will need to be placed in full 360° circles around the source in Phase 2. Releases will likely take place both in stable and unstable conditions. (Kirk.Clawson@noaa.gov, Rick Eckman, and FRD staff)

Birch Creek Valley Wind Flow Study

The draft manuscript "Diurnal Late Spring and Summertime Wind Patterns on the Snake River Plain and the Influence of Complex Terrain Factors" was rejected for publication in the Journal of Applied Meteorology and Climatology. The principal cause of rejection was not for technical reasons but for a perceived lack of a focus. This led to a reevaluation of where to go with this effort. The long term goal now is to utilize the NOAA/INL mesonet to examine spatial and temporal variability in σ_θ as an extension of the Project Sagebrush research. That would include and expand on much of the material

from this manuscript. Follow up work on another phase of analysis has begun but further progress is stalled pending availability of data from the U.S. Forest Service Fire Sciences Laboratory. (Dennis.Finn@noaa.gov)

ARL Convective Initiation Project

Dr. Shuyan Liu started work at FRD on 1 October. She was hired as a postdoctoral associate for a two-year term through the University of Maryland's Earth System Science Interdisciplinary Center (ESSIC). The focus of her position is to improve numerical forecasts of convective initiation by comparing model outputs with observations from two project field studies. The first study took place near Huntsville, Alabama in the summer of 2014. A second is planned for Florida in 2015. During the quarter, Dr. Liu conducted a literature investigation of previous convection studies relevant to the current project and also was developing code on the NOAA Zeus computer to support the project. Unfortunately, Dr. Liu abruptly departed the project in mid December for personal reasons. ARL will need to advertise the position again through ESSIC. (Richard.Eckman@noaa.gov, Shuyan Liu)

Wind Forecast Improvement Project (WFIP)

FRD's plans to deploy instruments in the wind farms near Idaho Falls ID were halted due to new information regarding the second phase of the Department of Energy's Wind Forecast Improvement Project, which is being called WFIP2. Originally, FRD had planned to deploy its mobile systems in Idaho for a year or so and then move them to the WFIP2 study area when required. This was based on the assumption that the WFIP2 deployments would not start until fiscal year 2016. Recently, however, the Department of Energy announced a winner for its WFIP2 Funding Opportunity Announcement. The winning proposal focuses on wind farms near the Columbia River Gorge along the Oregon-Washington border, with a proposed start date for deployments in July 2015. Because of the earlier start date, FRD must start focusing on the WFIP2 study area almost immediately and no longer has sufficient time for the Idaho deployments. (Kirk.Clawson@noaa.gov, Rick Eckman)

HYRad

It was reported last quarter that it was necessary to replace the Google Maps API with a no-cost Flash-based API from MapQuest due to the deprecation of the Google Maps Flash API. During the current quarter, MapQuest announced that the no-cost API just barely adopted for HYRad would require an expensive license beginning in January. An alternate free version, still available from MapQuest, was subsequently adopted. However, this API required additional rewriting of portions of HYRad. (Brad.Reese@noaa.gov)

A prototype user interface for creating multiple simultaneous source releases for HYRad was developed. Work on the architecture of the CONTROL and EMITIMEs files that are necessary to implement the multiple source scenarios is in progress. (Brad.Reese@noaa.gov, D. Finn)

Big Southern Butte

The manuscript below is in final editorial review at Atmospheric Chemistry and Physics:

Butler, B. W., Wagenbrenner, N. S., Forthofer, J. M., Lamb, B. K., Shannon, K. S., Finn, D., Eckman, R. M., Clawson, K., Bradshaw, L., Sopko, P., Beard, S., Jimenez, D., Wold, C., and Vosburgh, M.: High resolution observations of the near-surface wind field over an isolated mountain and in a steep river canyon, Atmos. Chem. Phys. Discuss., 14, 16821-16863, doi:10.5194/acpd-14-16821-2014, 2014.

Major revisions were requested after the initial review. Revisions and responses to reviewer comments were subsequently submitted by the lead authors. (Dennis.Finn@noaa.gov)

FRD Tracer Analysis Facility

The detectors for the fast response tracer analyzers have been cleaned. The analyzers use an electron capture detector (ECD) powered by a tritium foil. The foils are old and were very dirty. Since FRD does not have a specific radioactive materials license allowing us to disassemble the detectors, Qal-Tek Associates of Idaho Falls, ID, was hired to perform the work. They provided a licensed technician who performed the cleaning. Because the foils are old, their activity is significantly degraded. Unfortunately, replacements are no longer available. The cleaning helps the detectors be more sensitive and removes signal artifacts caused by the contaminants. This should make several of the detectors usable again and extend the usable life of the analyzers. (Roger.Carter@noaa.gov, S. Beard)

NOAA/IDAHO NATIONAL LABORATORY (INL) METEOROLOGICAL RESEARCH PARTNERSHIP

NOAA/INL Mesonet

During October 2014, a problem was discovered with the ingest of NOAA/INL Mesonet weather data into the NOAA MADIS database. It appears that the data are occasionally inserted in the MADIS database at incorrect times. MADIS has been notified and they are attempting to determine the cause of the problem. The extent of the problem is not known, but it may happen as often as 10 times every month. We will continue to work with MADIS to resolve this issue. (Roger.Carter@noaa.gov)

About one year ago, we purchased a VHF radio modem; model RF500M, from Campbell Scientific. This is the only VHF radio modem currently available from Campbell Scientific. We were planning to use it in the Campbell Scientific radio network that collects measurements from the NOAA/INL Mesonet. Unfortunately, it did not work. After nine months of testing and retesting, Campbell Scientific was eventually convinced that there was a bug in the RF500M firmware. In December 2014, approximately one year after purchase, we received a firmware upgrade from Campbell Scientific that should fix the problem. We will test it as soon as weather conditions are appropriate. We are grateful the problem has been addressed but disappointed that it required so much time.
(Roger.Carter@noaa.gov, S. Beard, T. Strong, B. Reese, FRD staff)

Emergency Operations Center (EOC)

The Idaho National Laboratory conducted its first evaluated Beyond Design Basis exercise on 21 October. Nearly every on-site institution participated. Off-site participants included the Idaho Department of Environmental Quality and the Idaho Bureau of Homeland Security. Kirk Clawson and Jason Rich participated as NOAA dispersion experts. The exercise scenario centered around an earthquake that affected 6 different facilities on the Idaho National Laboratory. Multiple hazards were created at the various facilities that required the simultaneous use of HYRad on two separate computers. Simulated personnel evacuations by the INL and road blocks by the Idaho State Police were determined based on HYRad output. The HYRad system performed without a hiccup. Short term weather forecasts as well as nowcasts were also provided.

INL Hazardous Weather Alert System

Only three hazardous weather alerts were issued during this past quarter. All three of these alerts were issued for high winds.

OTHER ACTIVITIES

Safety

The FRD hazardous materials list was completely updated during this quarter. We have also acquired the most up-to-date Safety Data Sheet available for each material on the list as required by OSHA regulations. (Donna.Davis@noaa.gov, R. Carter)

Four employees attended the Fit for Life Health Fair at DOE-Idaho on November 6, 2014.

Training

All federal employees completed the required Time and Attendance training in November 2014.

All FRD employees completed the annual INL General Employee training in November 2014. This is required by the INL for access to their facilities.

Duane Nelson with the Idaho Falls Fire Department provided FRD staff with CPR/First Aid/AED Training on December 4, 2014.

All employees completed the mandatory No FEAR training in December 2014.

Kirk Clawson, Richard Eckman, and Donna Davis completed the travel card recertification in December 2014. This training is required every three years.

Outreach

Rick Eckman answered an Ask a Scientist question from a local elementary school student in November. The question was "What is an Indian Summer?" The question and answer appeared in the 18 November edition of the Idaho Falls Post Register newspaper.

Misc.

Federal employees participated in the Combined Federal Campaign (CFC) in November.

Brad Reese received a 2014 NOAA Administrator's Award along with other partners from ARL and NOS OR&R "for major advances in toxic gas dispersion model forecasting capabilities for the Nation to better protect human life and property." Congratulations Brad!

All DOE badges were renewed for another year.